9/12/16

"Success is not final, failure is not fatal: it is courage to continue that counts"-Winston Churchill

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HW: "Multiplying Radicals" worksheet #3, 5, 7, 9, 13, 15, 17, 19, 23, 25
Test on Tuesday 9/20

AIM: How do we Multiply Radicals?

Warm Up:

1) Simplify $2\sqrt{3y} - 5y^2 + 4\sqrt{3y} + \sqrt{36y^4}$

⊛ Even powers are perfect squares

$\boxed{2\sqrt{3y}} - 5y^2 + \boxed{4\sqrt{3y}} + 6y^2$

$\boxed{6\sqrt{3y} + 1y^2}$

⊛ When adding/subtracting with radicals:
- The index must be the same
- The radicand (term under) must be the same.

⊛ Keep the radicand and combine the coefficients

1) $-5\sqrt{3} - 3\sqrt{3}$ = $\boxed{-8\sqrt{3}}$

-8

2) $2\sqrt{8} - 1\sqrt{8}$ = $1\sqrt{8} = \sqrt{8} = \boxed{2\sqrt{2}}$

1

$\sqrt{4}\ \sqrt{2}$

$2\sqrt{2}$

3) $-3\sqrt{12} + 3\sqrt{3} + 3\sqrt{20}$

$\sqrt{4}\ \sqrt{3}$ $\sqrt{4}\ \sqrt{5}$

$-3 \cdot 2\sqrt{3}$ $3 \cdot 2\sqrt{5}$

$\underbrace{-6\sqrt{3} + 3\sqrt{3}} + 6\sqrt{5}$

$\boxed{-3\sqrt{3} + 6\sqrt{5}}$

4) $a\sqrt{27} - 2\sqrt{3a^2}$

$\sqrt{9}\ \sqrt{3}$ $\sqrt{a^2}\ \sqrt{3}$

$a\ 3\sqrt{3} - 2a\sqrt{3}$

$3a\sqrt{3} - 2a\sqrt{3}$

$\boxed{a\sqrt{3}}$

5) $3\sqrt{242x^5y^5} + 11xy\sqrt{2x^3y^3}$

$\sqrt{121x^4y^4}\ \sqrt{2xy}$ $\sqrt{x^2y^2}\ \sqrt{2xy}$

$3 \cdot 11x^2y^2\sqrt{2xy}$ $11xy \cdot xy\sqrt{2xy}$

$\underline{33x^2y^2}\sqrt{2xy} \underline{+ 11x^2y^2}\sqrt{2xy}$

$\boxed{44x^2y^2\sqrt{2xy}}$

When we Multiply radicals:

1. Outside X Outside → Stays outside
2. Inside X Inside → Stays inside

   $\sqrt{} \times \sqrt{}$

3. Simplify (Break Out, if we can)

✱ Perfect to be taken out.

$(2x) \cdot (3x) = 6x^2$ or $(2x) \cdot (3y) = 6xy$

$(2\sqrt{3}) \cdot (3\sqrt{2}) = 6\sqrt{6}$ $\qquad 2\sqrt{3} \cdot 1\sqrt{5} = 2\sqrt{15}$

6) $\sqrt{2}\cdot\sqrt{50} = \sqrt{100} = 10$

$\sqrt{25}\,\sqrt{2}$

$1\sqrt{2} \quad 5\sqrt{2} = 5\sqrt{4}$

$5\cdot 2 = 10$

Multiply first, then simplify.

7) $\sqrt{7}\cdot\sqrt{7} = \sqrt{49} = 7$

If we are multiplying identical square roots, the result is just the radicand.

cubes

8) $\sqrt[3]{8}\cdot\sqrt[3]{27} = \sqrt[3]{216} = \boxed{6}$

9) $3\sqrt{2}\cdot 1\sqrt{10} = 3\sqrt{20} = 6\sqrt{5}$

$\sqrt{4}\,\sqrt{5}$

$3\cdot 2\sqrt{5}$

$6\sqrt{5}$

10) $\frac{\sqrt{21}}{1}\cdot\sqrt{\frac{4}{3}} = \sqrt{\frac{84}{3}} = \sqrt{28}$

$\sqrt{\frac{21}{1}\cdot\frac{4}{3}}$

$\sqrt{4}\,\sqrt{7}$

$2\sqrt{7}$

11) $(3\sqrt{12})^2 =$

$(3\sqrt{12})(3\sqrt{12}) = 9\sqrt{144}$

$9 \cdot 12 = \boxed{108}$

$(\sqrt{12})^2$

$\sqrt{12} \cdot \sqrt{12} = 12$

b/c $\sqrt{144} = 12$

12) $2\sqrt{ab} \cdot 2\sqrt{ab^2} = 4\sqrt{a^2b^3}$

$\sqrt{a^2b^2} \quad \sqrt{b^1}$

$\boxed{4ab\sqrt{b}}$

ex:

$\sqrt{b^5c^5}$

$\sqrt{b^4c^4} \quad \sqrt{bc}$

$\sqrt{a^{301}} = \sqrt{a^{300}}\sqrt{a^1}$

$\sqrt{a^{300}} = \sqrt{a^{150}}\sqrt{a^{150}} = a^{150}$

$5x - 50y$ can't be changed

13) $\sqrt{5}(1-\sqrt{10}) = 1\sqrt{5} - \sqrt{5}\sqrt{10}$

$\sqrt{5} - \sqrt{50}$

$\sqrt{25}\sqrt{2}$

$\boxed{\sqrt{5} - 5\sqrt{2}}$

14) $\left(x-\sqrt{3y}\right)\left(2x-\sqrt{3y}\right)$

HW: "Multiplying Radicals" w/s #31, 33, 37, 39, 42

Test 1 on Tuesday 9/20

Warm Up: Simplify

Perfect cubes: 1, 8, 27, 64, 125

$2\sqrt[3]{24x^3y^4} + 4x\sqrt[3]{81y^4} - 3y\sqrt[3]{24x^3y}$

$\sqrt[3]{8x^3y^3}\ \sqrt[3]{3y}$ $\quad$ $\sqrt[3]{27y^3}\ \sqrt[3]{3y}$ $\quad$ $\sqrt[3]{8x^3}\ \sqrt[3]{3y}$

$2\cdot 2xy\sqrt[3]{3y}$ $\quad$ $+4x\cdot 3y\sqrt[3]{3y}$ $\quad$ $(-3y)\,2x\sqrt[3]{3y}$

$4xy\sqrt[3]{3y}$ $\quad$ $+12xy\sqrt[3]{3y}$ $\quad$ $-6xy\sqrt[3]{3y}$

$$\boxed{10xy\sqrt[3]{3y}}$$